**From:** Lucille Watkins [mailto:safety@umwa.org]
**Sent:** Tuesday, October 14, 2003 10:58 AM
**To:** nichols-marvin@msha.gov
**Subject:** UMWA comments - Diesel Particulate Matter Exposure of Underground Metal and Nonmental Miners

Dear Mr. Nichols:

Attached are the UMWA's comments prepared by Jim Weeks, ScD, CIH regarding the Proposed Rule on Diesel Particulate Matter Exposure of Underground Metal and Nonmetal Miners. Copies will also be mailed and faxed to your office.
Joe Main

10/14/2003

**MSHA Docket**
**No. AB29-COMM-31**

October 14, 2003

**Comments by**
**James L. Weeks, ScD, CIH**
**Senior Scientist, Advanced Technologies and Laboratories International, Inc.**
**on behalf of the International Union of the United Mine Workers of America.**

Re: Mine Safety and Health Administration. Diesel Particulate Matter Exposure of Underground Metal and Nonmetal Miners
68 Fed Reg 48668, August 14, 2003.

In regard to the above-captioned proposed rule, I wish to comment on the following issues:

1. Reducing miners' exposure to diesel particulate matter is needed because (a) exposure to diesel particulate increases the risk of a lethal disease, lung cancer and (b) current levels of exposure are the highest of any persons in the U.S. and are unacceptable.
2. Elemental carbon is not a suitable surrogate for diesel particulate matter
3. Exclusive reliance on personal exposure monitoring is an invitation to abuse and needlessly constrains the agency's ability to monitor the mine environment.
4. Use of an error factor to raise the effective exposure limit is unfair and increases miners' risk of disease.
5. Use of respirators for the purpose of compliance is not acceptable. If miners will use respirators, operators should provide medical testing, exposure monitoring, respirator maintenance, and other features of a program of respiratory protection to ensure that respirators will provide the protection intended.
6. Both the interim limit and the final limit are feasible for the industry; it is inappropriate to consider feasibility on a mine by mine basis; and MSHA does not have an acceptable means of evaluating any individual operators' claim that controls are not feasible.

## Introduction

The present rule-making is exceptional in that the procedures that MSHA has used to delay and then modify the rule duly promulgated on January 19, 2001 were extraordinary and improper. In this regard, we wish to draw your attention to and support comments on this rule by Peter Galvin and by Thomas McGarity et al. at the Center for Progressive Regulation. The January 2001 rule was several years in the making and went through the formal rule-making process, including an advanced notice, a proposed rule, public hearings and comments, and a final rule. It should not have been cast aside as casually as it was. This represents a serious breach of order in making rules for protecting miners. What the agency has done affects all miners and all workers because it undermines the integrity of the rule-making process itself. We believe the rule proposed in August 2003 should be withdrawn and the agency should enforce the rule

that was properly promulgated. That said, significant problems exist concerning the merits of the present rule.

**This rule is needed because (a) exposure to diesel particulate increases the risk of a lethal disease, lung cancer and (b) current levels of exposure are the highest of any persons in the U.S. and unacceptable.**

The Mine Health Research Advisory Committee and the Diesel Advisory Committee (I was a member of both committees) both recommended that MSHA reduce miners' exposure to diesel particulate matter. The basis for this recommendation was an emerging body of scientific literature suggesting that exposure to diesel particulate matter increased the risk of death from lung cancer. MHRAC made this recommendation in 1984 (19 years ago) and the DAC in 1986 (17 years ago. Since that time, there have been numerous studies that have reinforced this concern and the National Institute for Occupational Safety and Health, the Environmental Protection Agency, and the International Agency for Research on Cancer have all concluded that diesel particulate matter should be treated as a carcinogen. These conclusions date from 1987, 1988, and 1989, respectively. What we have learned since then supports these concerns.

Let me comment on the three recent studies included in the proposal (at p 48690), namely, by Boffetta et al (2001), Gustavsson et al. (2000), and Pope et al (2002). All three are positive for premature death from lung cancer and all three had relative weak measures of exposure and could have easily been negative by random misclassification. Boffetta et al measured exposure by classifying jobs as low, medium, and high exposure. Gustavsson et al measured exposure by questionnaire of cases and controls. Pope et al measured exposure by questionnaire. Positive studies with weak exposure measurements occur when there is a strong relationship between the exposure (diesel exhaust) and the outcome (lung cancer). Ironically, it is the weaknesses of these studies that strengthen the conclusion that diesel particulate matter causes lung cancer.

Lung cancer is the most common of all cancers and it is one of the cancers least responsive to treatment. A diagnosis of lung cancer is a death sentence. Over the past twenty years, the five-year survival rate (the percent of persons alive five years after diagnosis) has improved barely two percentage points and that "improvement" is a result of our ability to diagnose the disease earlier in its natural history; it reflects no improvement in our success at treating this disease. Now, as twenty years ago, nearly 90% of persons are dead five years from diagnosis. This disease must be prevented.

The Environmental Protection Agency considers 50 $\mu g/m^3$ an unacceptable "hot spot." The American Conference of Governmental Industrial Hygienists first proposed a Threshold Limit Value of 20 $\mu g/m^3$, and is now revising that proposal. When NIOSH conducted its risk assessment, it predicted a risk of 1 in 1,000 (the Supreme Court's suggestion of "significant risk") at 100 $\mu g/m^3$. Other risk assessments have recommended lower levels. The railroad workers study done by investigators at Harvard Medical School (a "classic study," according to the chairman of the DAC), were exposed to levels between 100 to 200 $\mu g/m^3$. So we have no sympathy for mine operators'

complaints about an interim limit of 400 $\mu g/m^3$ (dpm) or a final limit of 160 $\mu g/m^3$. Miners now are exposed to levels up to 2,000 $\mu g/m^3$. This is unconscionable. Moreover, exposure at this level has been known since at least the mid 1980's. Yet MSHA has moved slowly and mine operators have objected at every opportunity, the most recent being colluding to stop the January 2001 rule.

**Elemental carbon is not a suitable surrogate for diesel particulate matter**.

We understand that diesel particulate matter was rejected as a suitable measure of exposure because of interferences, specifically from environmental tobacco smoke (ETS) and from oil mist. Elemental carbon was chosen as a surrogate because these sources of interference were eliminated. This issue deserves continued study in light of several factors. First, nearly all investigations into the health effects of exposure to diesel particulate matter were conducted on whole diesel particulate. Consequently, the most appropriate exposure to measure is the whole particulate. This is so not only because we need to measure the most relevant exposure but also because it may be the whole particulate or something other than elemental carbon that is the ultimate carcinogenic agent. Diesel particulate matter is combined with hundreds of organic compounds, including polycyclic aromatic hydrocarbons (PAH) compounds and nitro-PAH, many of which are known to be carcinogenic.

A second problem is that while there are interferences, using EC as the surrogate deals with the interference problem but brings one of its own. In making the transformation from EC to its equivalent TC or dpm, MSHA proposes an adjustment of 1.3. If the ratio of EC to TC were stable and equal to 1 / 1.3, this would be reasonable. But this is not a stable ratio; there is a significant amount of variability. In one study I looked at (Birch et al. 1999), the mean value of EC/TC was 0.5 and two standard deviations above and below the mean went from zero to 1.0. This ratio must be between zero and one and the selection of values I examined took up the full range. This instability becomes worse when a filter is put on the diesel engine. As noted in the preamble to the promulgated rule, filters preferentially remove elemental carbon over other particulate matter so that using this as a surrogate could give a falsely low measure of exposure.

The interferences from ETS introduced less variability into the measure of exposure than does EC. Furthermore, the interference problem could have been solved in some other way. For example, both ETS and oil have characteristic chromatograms that make it possible to compensate for these agents. The measures of dpm were successfully adjusted for ETS by the investigators at Harvard.

Therefore, for the final limit, I think the agency and others should keep an open mind on the use of EC, revisit the issue after we have gained some experience, and consider using a better measure than EC.

**Exclusive reliance on personal exposure monitoring is an invitation to abuse and needlessly constrains the agency's ability to monitor the mine environment.**

The UMWA and MSHA have had a long and difficult history in monitoring coal miners' exposure to respirable dust. (see Weeks, 2003). It is a history, in brief, in some mine operators abusing the trust that was given to them to monitor miners' exposure. Many cheated and submitted fraudulent samples. The vehicle for cheating was the personal sample. Granted, most of those fraudulent samples were taken by mine operators while MSHA will be taking samples in Metal and Non-Metal mines. Even so, exclusive reliance on personal samples creates an opportunity for mine operators to manipulate the sampling process and yield false results. We do not say this out of malice but out of 30 years of experience. MSHA should have available all kinds of sampling: occupational, area, personal, and engine-specific. The need is to reduce exposure and MSHA should not create a situation in which sampling is biased or lacks credibility.

**Use of an error factor to raise the effective exposure limit increases miners' risk of disease.**

As it has for other hazards -- noise and respirable dust -- MSHA proposes using an error factor to adjust the exposure limit and give citations for non-compliance only when exposure exceeds the exposure limit plus the error factor. As we have said elsewhere, this gives the benefit of doubt to mine operators and exposes miners to diesel particulate matter above an already inadequate exposure limit. Miners' health should be given precedence over mine operators' property rights.

**Use of respirators for the purpose of compliance is not acceptable. If respirators will be used by miners, operators should provide medical testing, exposure monitoring, respirator maintenance, and other features of a program of respiratory protection to ensure that respirators will provide the protection intended.**

Respirators should not, under any circumstances, be used for the purpose of determining compliance. It is standard practice in industrial hygiene and in virtually every professional discussion of respirators that this way of protecting workers in inferior to all others. Respirators leak, they interfere with communication, they increase the work of breathing, and they are stressful. Instead of creating one system to protect all workers, use of respirators creates one system per worker each of which needs maintenance. Moreover, some workers cannot wear respirators for a variety of reasons. Routine use of respirators breeds carelessness. .

There are circumstances under which respirators are appropriate. Under those circumstances, a respiratory protection program should be used to ensure that respirators provide the protection they are supposed to provide. Such a program would include medical examination of potential wearers, worker education, exposure monitoring, respirator maintenance, and other factors. On these issues, we support the views of the United Steelworkers.

**Both the interim limit and the final limit are feasible for the industry; it is inappropriate to consider feasibility on a mine by mine basis; and MSHA does not**

**have an acceptable means of evaluating any individual operators' claim that controls are not feasible.**

Throughout the course of this rule-making, MSHA has promoted and developed feasible controls that would reduce miners' exposure to diesel particulate matter. MSHA and NIOSH have provided mine operators with state of the art technology and methods for reducing exposure. Filters exist that will remove, at a minimum, 80% of diesel particulate matter. Other methods include

- purchasing machines with inherently low emissions,
- maintaining machines to keep emissions down,
- using low sulfur fuel,
- keeping fuel clean,
- stopping machines from idling,
- limiting the number of machines on one air course,
- increasing ventilation,
- using diffusers to avoid areas of high concentration,
- etc.

These methods have proven effective in other mines; they will be effective in mines in the U.S. Educational programs offered by MSHA, NIOSH, and others are listed starting on p 48678. In brief, there are many methods that, in combination, can be used to reduce exposure. (NIOSH, IC 9462, 2002)

Operators' claims that the final limit is not feasible are simply not credible. Effective and feasible control methods exist and those that have used them conscientiously have reduced exposure for their miners.

Feasibility, moreover, applies to the standard; it does not apply to enforcement matters. The word occurs only once in the Mine Act and that is in the standards-setting paragraph, where it belongs

Finally, MSHA proposes to evaluate operators' claims that controls are not feasible. This decision is left to the District Managers who, apparently, given little support from MSHA headquarters. This is an untenable situation. Such decisions should be made in Arlington and there should be specific criteria to determine whether an operator has made a good faith effort to control exposure. For example, a mine operator would have to show that he had implemented the list of control measures above and had systematically measured exposure to evaluate measures.

**References**.

Birch ME, Dahmann D, Fricke HH. Comparison of two carbon analysis methods for monitoring diesel particulate level in mines. J. Environ Monit. 1: 541-44, 1999.

Weeks JL. The fox guarding the chicken coop: Monitoring exposure to respirable coal mine dust, 1969-2000. Am J Public Health 93(8):1236-44, 2003.

NIOSH. Review of technology available to the underground mining industry for control of diesel emissions. IC 9462, 2002.